

The F/A-22: A More Cost Effective Alternative

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The F/A-22: A More Cost Effective Alternative
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Submitted by Capt Larry B. "Fletch" Fletcher, Jr.
to
Major Thomas K. Simpers, CG 9
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SETTING THE STAGE

The United States Air Force (USAF) F/A-22 pilot noted his altitude was 25,000 feet as he changed course to 355 degrees, turning on to the intercept course given him by the E-3 Airborne Warning and Control System (AWACS) weapons director. He closed the distance to the enemy aircraft to 18 miles, and verified that he had "locked up" the enemy aircraft with his fire control radar. Selecting an AIM-120 advanced medium-range air-to-air missile (AMRAAM), he fired on the enemy aircraft. A few seconds later he called "splash one" after watching the satisfying fireball that had moments ago been an Iranian MiG-29 air superiority fighter. A third of the world away, at almost the exact same moment, the pilot of a US Air Force F-16C completed the same maneuver against a North Korean SU-27 air superiority fighter with similar results. The MiG-29 and SU-27 are the best Russian-built air superiority aircraft and among the best in the world. This is, of course, a fictional account, but the story is no stretch of the imagination. The account illustrates very well how successful the F/A-22 would be against current and future air threats, but also serves to point out that the US Air Force's current frontline fighters can achieve the same results. The Air Force has set its sights on the F/A-22 Raptor to replace its aging F-15C fleet as its primary air superiority fighter. At a cost of \$133.3 million per aircraft and with a goal of

fielding 160 aircraft¹ by the end of the decade, the Air Force plans to sink billions of dollars into this one aircraft. Considering the success the United States (US) has had in applying airpower in its last five conflicts and the fact that a single F-15C, the world's most successful air superiority fighter, costs only \$29.9 million², the F/A-22 purchase is difficult to justify. In fact, given the low tech opponents the US faces today and is forecast to face in the near future, the Air Force can purchase cheaper aircraft than the F/A-22 to replace the F-15C and continue to achieve the same levels of success that have become common place.

REPLACING THE F-15C FLEET

None would argue that the United States must replace its aging F-15C fleet. Two thirds of the Air Force's F-15Cs are over 21 years old.³ The aging aircraft are capable of very high speeds and tight turns that generate forces on the airframes that can equal up to seven times the force of gravity. Performance of this sort for such a long time is taking its toll on the aircraft. Parts are cracking and falling off in flight

¹ <<http://www.f-22raptor.com/>> (accessed 2 January 2005).

² <<http://www.af.mil/factsheets/factsheet.asp?fsID=101>> (accessed 6 February 2005).

³ James G. Roche, "Preserving our Edge," (remarks to the National Security Forum, Maxwell AFB, Ala., May 30, 2003) <<http://www.af.mil/speech/speech.asp?speechID=33>> (accessed 2 January 2005).

creating obvious safety concerns.⁴ But deteriorating airframes are not the only reason that Air Force officials want to replace the F-15C. Many believe the aircraft is obsolete; that it cannot survive and accomplish its mission in the twenty-first century.

THE PERFORMANCE REQUIREMENTS FOR THE F-15C'S REPLACEMENT

In the early 1980s, the Air Force recognized that the then current advanced technologies could lead to aircraft that would render the F-15 and F-16 obsolete. As stated on an official Air Force website, "In 1981, the Air Force developed a requirement for...a new air superiority fighter. It would take advantage of the new technologies in fighter design including composite materials, light weight alloys, advanced flight control systems, higher power propulsion systems and stealth technology."⁵ To better understand the Air Force's view of the requirement, one should consider the words presented in an Air War College paper written by Lt Col Devin L. Cate. He wrote that the Air Force's air superiority fighter must have "...the capability to defeat advanced air-to-air and surface-to-air threats; to survive in an anti-access environment imposed by a modern IADS (integrated air defense system); and to participate fully as sensor and shooter

⁴ Carlos Bongioanni, "Age Taking a Toll," Stars and Stripes Magazine, 23 February 2003, <<http://www.estripes.com/article.asp?section=126&article=14770&archive=true>> (23 January 2005)

⁵ <http://www.wpafb.af.mil/museum/modern_flight/mf21a.htm> (accessed 23 January 2005).

within a modern warfare network.⁶ Lt Col Cate, an Air Force flight test engineer and published author, goes on to state that the F/A-22 meets these requirements and is "the best near-term solution for a twenty-first century fighter."⁷

THE CASE FOR THE F/A-22

After Vietnam, and the large scale conventional battles between Israel and her Arab neighbors in the late 1960s and early 1970s, the US recognized an increasing Soviet conventional warfare capability.⁸ To counter the Soviet capabilities, the Air Force developed the F-15 to ensure air superiority over the skies of Europe. The Soviet answers to the F-15 were the SU-27 and the MiG-29 fighter aircraft. These aircraft have been characterized by the Air Force leadership as somewhat superior to the F-15C.⁹

To counter growing Soviet aircraft technology, the Air Force submitted a requirement for an aircraft possessing stealth and other advanced capabilities as mentioned earlier. Both Lockheed and Northrop developed aircraft to meet the requirement with Lockheed developing the YF-22 and Northrop putting together

⁶ Devin L. Cate, *The Air Superiority Fighter and the Defense Transformation: Why DOD Requirements Demand the F/A-22 Raptor*, Air War College Maxell Paper No. 30 of *The Maxwell Papers* (Maxwell Air Force Base, Alabama: Air University Press, 2003), 11.

⁷ Cate, 18.

⁸ Benjamin S. Lambeth, *The Transformation of American Air Power* (Cornell University Press: Ithaca and London, 2000), 54 - 56.

⁹ <<http://www.fas.org/man/dod-101/sys/ac/f-15.htm>> (accessed 18 January 2005).

the YF-23. As the competing programs matured, the superiority of YF-23's stealth characteristics became clear; however, the Air Force chose the YF-22, citing the aircraft's sufficient stealth characteristics and superior maneuverability and weapons bays.¹⁰ The F/A-22 was designed primarily as an air superiority aircraft with an air-to-ground capability added shortly before the aircraft was operationally fielded. The aircraft has the latest stealth technology, supercruise capability, tremendous maneuverability enabled by thrust vectored exhaust, and avionics that never require the pilot to remove his or her hands from the flight controls. Without a doubt, the F/A-22 is the best air superiority aircraft in the world. In recent flight testing involving mock air combat between F/A-22 and F-15Cs, the F/A-22 has hands down proven superior. In each air combat scenario, the F-15Cs began the fight in an advantageous position. The result is consistently the same: Within seconds, the F/A-22s maneuvered out of the disadvantageous position "killed" the F-15Cs.¹¹

CHEAPER ALTERNATIVES TO THE F/A-22

Despite the unfielded F/A-22's superiority over the F-15C, the F-15 still reigns supreme in the skies. It has a war record of 95 kills with no F-15s shot down by enemy aircraft. Despite its unequaled performance, Air Force leaders still insist that

¹⁰ Jeff Scott, "The F-22 History," <<http://www.aerospaceweb.org/question/planes/q0021a.shtml>> (8 April 2001) (accessed 2 January 2005).

¹¹ Laura M. Colarusso, "For Raptor challengers, losing's part of the job," *Air Force Times*, 7 February 2005, 15.

the F/A-22 must replace the F-15. At \$133.3 million per aircraft, finding a cheaper, alternative to the F/A-22 requires little external motivation. With the fall of the Soviet Union, the aircraft that the F/A-22 was designed to defeat have proven no match for current US aircraft. Furthermore, the IADS US aircraft have had to contend with in our conflicts since the Vietnam War have proven quite surmountable challenges.

Considering the last two facts, it does not make sense to spend on the F/A-22 three times the price of an F-15C, when the F-15 is getting the job done. We still have a need, however, to replace our aging F-15s. Since the F-15C costs only \$29.9 million per aircraft, a logical conclusion is to purchase new F-15s to replace the old ones. The US Navy had the right answer when it replaced its aging F/A-18C/D fleet with an improved version of this successful aircraft, the F/A-18E/F. The Navy fielded the new aircraft for a fraction of the cost of something like the F/A-22. The Air Force could do the same by fielding a brand new, enhanced version of the F-15. According to Dr James Roche, former Secretary of the Air Force, the Republic of South Korea has in the F-15K, the best twin-engine multi-role fighter in the world.¹² With the F-15K's air-to-air and air-to-ground deep strike capability and the F-15's proven war record, this

¹² <<http://www.boeing.com/defense-space/military/f15/f-15k/overview.htm>> (accessed 6 February 2005).

seems to be the ideal alternative to the F/A-22. The F-15K would be, by far, cheaper than the F/A-22 and would continue US dominance of the skies in America's wars.

To amplify the last point, consider the price of one F-15K. Neither Boeing nor South Korea seem to have published a unit cost of one F-15K; however, one can make a good guess extrapolating the unit cost of the F-15K's parent aircraft, the F-15E. A single F-15E costs the US Air Force \$31.1 million in fiscal year 1998 dollars.¹³ Even if the F-15K costs twice as much as the F-15E, the Air Force could purchase two F-15Ks for the price of one F/A-22. The F/A-22 may provide the world's best air-to-air capability and a limited air-to-ground capability, but a single F-15K, in the absence of the F/A-22, would be the world's best air-to-air fighter and carry seven times the air-to-ground payload.¹⁴ Clearly, America would be unwise to waste another dollar on the F/A-22.

THE DISADVANTAGES OF THE F/A-22: PARTING SHOTS

Even though the F/A-22 may be the best air superiority fighter in the world, it leaves a lot to be desired as an attack aircraft. The internal weapons storage, one of the features that enable the aircraft's stealth is its most prevalent shortcoming as an attack aircraft. The weapons bays were

¹³ <<http://www.af.mil/factsheets/factsheet.asp?fsID=102>> (April 2003) (accessed 6 February 2005).

¹⁴ The F/A-22 can carry two one thousand pound bombs; the F-15E can carry seven two thousand pound bombs.

designed to carry air-to-air missiles. In relation to the size of bombs, air-to-air missiles do not have a very large diameter; therefore, the internal weapons bays cannot accommodate bombs larger than 1000 pounds.¹⁵ This renders the aircraft not very useful as an attack aircraft. To destroy large targets such as bridges, 2000 pound bombs and larger are required.¹⁶ To destroy tanks and other such targets with small bombs, laser guided bombs are needed which require laser designators. Laser designators are not installed on the F/A-22 and installing them on the F/A-22 will not be done inexpensively since to install a laser designator externally would destroy the aircraft's stealth capabilities. Finally, the greatest drawback of the F/A-22 is the price tag. A single aircraft costs \$133.3 million. For the price of one F/A-22, the Air Force can purchase 4 F-15Es. The F/A-22 is so expensive that commanders may be averse to risking these aircraft in combat without employing a number of other aircraft such as the F-16CJ and EA-6B to protect the F/A-22 from surface-to-air threats (as was the case with the B-2 stealth bomber in OPERATION IRAQI FREEDOM), negating the reason for purchasing the "stealthy" F/A-22 in the first place.

¹⁵ <<http://www.globalsecurity.org/military/systems/aircraft/f-22-weapons.htm>> (accessed 6 February 2005).

¹⁶ Lambeth, 39.

CONCLUSION

The F/A-22 is the world's greatest air superiority fighter; however, if the F/A-22 is removed from the stage, America's current air superiority fighter, the F-15C, holds the same title. American tax payers should not have to foot the \$133 million per aircraft bill for an aircraft whose mission can be accomplished by an F-15 that costs only \$31.1 million. Recall the scenario in the opening paragraph of this paper. A MiG-29 shot down by an F-15 is just as destroyed as if it were downed by the ultra-expensive F/A-22; only the American taxpayer will sense the difference.

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